

## Tárgytematika / Course Description Construction Materials 1.

EKNB\_EETA019

Tárgyfelelős neve /

Teacher's name: dr. Bozsaky Dávid

Félév / Semester: 2024/25/2

Beszámolási forma /

Assesment: Vizsga

Tárgy heti óraszám /

Teaching hours(week): 2/0/1

Tárgy féléves óraszám /

Teaching hours(sem.): 0/0/0

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### OKTATÁS CÉLJA / AIM OF THE COURSE

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### TANTÁRGY TARTALMA / DESCRIPTION

The subject introduces students to the basic knowledge about materials used in building construction industry. It presents the physical, chemical and mechanical properties of building materials and deals with qualification methods. It introduces students to the Hungarian and European technical standardization systems. It intends to make future designers to choose and apply the technically and economically optimal material from the available variety of building materials.

#### *Lectures*

General information about the subject. Introduction, basic knowledge of material science.  
Basic concepts of chemistry, chemical reactions. The micro- and macrostructure of materials.  
Physical, chemical and mechanical properties of building materials.

Types and material properties of stones and aggregates. Qualification of aggregates.

Types and material properties of inorganic binders (lime, gypsum).

Types, properties and standard marking of cement.

Types and material properties of organic binders and asphalt.

Basic concept and components of concrete. Standard marking of concrete.

Technology of making concrete.

Material properties of fresh and hardened concrete. Concrete degradation and concrete protection. The deformation behaviour of the concrete. Factors affecting the strength of concrete.

Special types and technologies of concrete.

Types and material properties of mortars.

Types and material properties of building ceramics.

Summary, mid-term test, pre-exam, guest lecture (optional)

#### *Lab*

Measurement and measuring Instruments.

Determination of physical, chemical and mechanical properties of building materials (mass, volume, density, bulk density, porosity). Determination of stress-strain curve and elastic modulus.  
Standard qualification tests of stones and aggregates.  
Standard qualification tests and marking of gypsum.  
Standard qualification tests and marking of cement.  
Standard qualification tests and marking of bitumen, modified bitumen and asphalt.  
Standard qualification tests of mortars and building ceramics.

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## SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESMENT'S METHOD

### *Evaluation*

Students have 1 mid-term test and a homework during the semester. The homework has two-grade, the mid-term test has a five-grade evaluation.

### *Deadlines and remediation options*

There is one remediation option for the homework and the mid-term test. Depending on the timetable of the current semester, the deadline of the homework submission is the 6-8th week of the semester, re-submission opportunity is 2 weeks later (8-10th week of the semester). Depending on the timetable of the current semester, the date of the mid-term test is the 11-13th week of the semester, remediation is in the 14th week of the semester. Laboratory protocols can be submitted continuously during the semester, but their final submission deadline is the last day of the semester at 12:00.

Students who successfully completed the homework and the mid-term test can take a pre-exam in the last week of the semester. The student can receive offered grade based on the result of the pre-exam and the grades of the mid-term test.

### *Terms of recognition*

Participation in the lab session (more than one unauthorized absence is not allowed), successful completion of the homework and the mid-term test (minimum sufficient or satisfactory grades), submission of laboratory protocols by deadline.

A successful exam is required for recognition of the semester.

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## KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

### **Obligatory reading**

D. Bozsaky: Construction materials 1. [slides and presentation], 2022

S. K. Duggal: Building Materials, New Age International, New Delhi (India), ISBN 978-81-224-2975-6, 2008, 544 p.

A. Deplazes: Constructing Architecture: Materials, Processes, Structures, Birkhäuser, Basel (Switzerland) ISBN 978-3-7643-7313-9, 2005, 479 p.

### **Recommended reading**

S. S. Bhavikatti: Basic Civil Engineering, New Age International, New Delhi (India), ISBN 978-81-224-2853-7, 2010, 300 p.

F. S. Merritt, J. T. Ricketts: Building Design and Construction Handbook, McGRAWHILL, New York (USA), ISBN 978-00-70419-9-95, 2000

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## AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL